

## EAST Search History

| Ref # | Hits | Search Query  | DBs                      | Default Operator | Plurals | Time Stamp       |
|-------|------|---|--------------------------|------------------|---------|------------------|
| L1    | 33   | serine adj dehydratase and mutant and corynebacterium | US-PGPUB; USPAT; DERWENT | OR               | ON      | 2007/08/04 14:51 |
| L2    | 31   | I1 and gene   | US-PGPUB; USPAT; DERWENT | OR               | ON      | 2007/08/04 14:51 |
| L3    | 31   | I1 and nucleic adj acid                               | US-PGPUB; USPAT; DERWENT | OR               | ON      | 2007/08/04 14:51 |

FORMAT

=> d ibib abs l3 1-7

L3 ANSWER 1 OF 7 BIOSIS COPYRIGHT (c) 2007 The Thomson Corporation on STN  
ACCESSION NUMBER: 1989:380139 BIOSIS  
DOCUMENT NUMBER: PREV198988060729; BA88:60729  
TITLE: EFFECTS OF L SERINE DEHYDRATASE  
ACTIVITY ON L SERINE PRODUCTION BY CORYNEBACTERIUM  
-GLYCINOPHILUM AND AN EXAMINATION OF THE PROPERTIES OF THE  
ENZYME.  
AUTHOR(S): KUBOTA K [Reprint author]; YOKOZEKI K; OZAKI H  
CORPORATE SOURCE: CENTRAL RES LAB AIJONOMOTO CO INC, 1-1, SUZUKI-CHO,  
KAWASAKI-KU, KAWASAKI, KANAGAWA 210, JPN  
SOURCE: Journal of Fermentation and Bioengineering, (1989) Vol. 67,  
No. 6, pp. 391-394.  
CODEN: JFBIEX. ISSN: 0922-338X.  
DOCUMENT TYPE: Article  
FILE SEGMENT: BA  
LANGUAGE: ENGLISH  
ENTRY DATE: Entered STN: 17 Aug 1989  
Last Updated on STN: 23 Sep 1989  
AB The results with *Corynebacterium glycophilum* AJ-370 and  
various mutants from AJ-3170 indicated that L-serine production  
was almost inversely proportional to L-serine degrading activity. The  
crude extract of the parental strain, AJ-3170, showed L-serine and  
L-threonine degrading activities. The 2 activities were completely  
separated from each other by gel-filtration, indicating that each activity  
comes from a different enzyme. The L-serine degrading enzyme, L-  
serine dehydratase (SD), was purified 30-fold from  
AJ-3170. Molecular weight of SD was 130,000. The enzyme was specific for  
L-serine, activated slightly by FeCl<sub>2</sub> and inhibited by MnCl<sub>2</sub>. The double  
reciprocal plots of SD rate against substrate concentration gave an  
upwards-curved line. The value of [S]0.5 was 35 mM.

L3 ANSWER 2 OF 7 BIOSIS COPYRIGHT (c) 2007 The Thomson Corporation on STN  
ACCESSION NUMBER: 1985:342296 BIOSIS  
DOCUMENT NUMBER: PREV198580012288; BA80:12288  
TITLE: IMPROVED PRODUCTION OF L SERINE BY MUTANTS OF  
CORYNEBACTERIUM-GLYCINOPHILUM WITH LESS  
SERINE DEHYDRATASE EC-4.2.1.13 ACTIVITY.  
AUTHOR(S): KUBOTA K [Reprint author]  
CORPORATE SOURCE: CENTRAL RESEARCH LABORATORIES, AJINOMOTO CO INC, 1-1  
SUZUKI-CHO, KAWASAKI-KU, KAWASAKI, KANAGAWA 210, JAPAN  
SOURCE: Agricultural and Biological Chemistry, (1985) Vol. 49, No.  
1, pp. 7-12.  
CODEN: ABCHA6. ISSN: 0002-1369.  
DOCUMENT TYPE: Article  
FILE SEGMENT: BA  
LANGUAGE: ENGLISH  
AB Fermentative production of L-serine using glycine as a precursor and C.  
glycinophilum as a microbial producer was improved by decreasing the  
enzymatic degradation of L-serine. The cellular activity of L-  
serine dehydratase (SD) [EC 4.2.1.13], which was  
responsible for the L-serine degradation, was decreased in mutants  
that could not assimilate L-serine as a N source or that required amino  
acids for their growth. Typical examples of the mutants were an  
L-leucine and L-isoleucine auxotroph (AJ-3414) which completely lacked SD  
and an L-leucine and L-methionine auxotroph (AJ-3413) whose SD activity  
was 32% of that of the parent. They accumulated 13.8 and 13.9 mg/ml of  
L-serine, respectively, from 30 mg/ml of glycine with a production yield  
of 46%, as compared to the parental productivity of 15.3%.

L3 ANSWER 3 OF 7 CAPLUS COPYRIGHT 2007 ACS on STN  
ACCESSION NUMBER: 2004:556884 CAPLUS  
DOCUMENT NUMBER: 141:156155  
TITLE: Study of glycolysis and L-serine metabolism in  
Corynebacterium glutamicum  
AUTHOR(S): Netzer, Roman  
CORPORATE SOURCE: Inst. fuer Biotechnologie, Juelich, 4130, Germany  
SOURCE: Berichte des Forschungszentrums Juelich (2004),  
Juel-4130, i-xii, 1-141  
CODEN: FJBEE5; ISSN: 0944-2952  
DOCUMENT TYPE: Report  
LANGUAGE: German  
AB The amino acid L-serine is a central metabolite in the metabolism and of increasing importance for the industrial use. The aim of this work was to investigate if L-serine can be produced biotechnol. by Corynebacterium glutamicum and to study the influence of L-serine degradation and the provision of glycolytic precursors. To improve the availability of glycolytic precursors for the L-serine biosynthesis, a pyruvate kinase and 3-phosphoglycerate mutase deletion mutant was constructed. It could be shown that pyruvate kinase is essential for growth both on the non PTS (phosphotransferase system) sugar ribose and on the gluconeogenetic substrates acetate and citrate. Global gene expression analyses and enzyme assays with a suppressor mutant showed, that the growth of the pyruvate kinase mutant on acetate and citrate could be restored by overexpression of the *mez* gene encoding the malic enzyme. Further it was shown, that the pyruvate kinase mutant accumulates glycolytic precursors for L-serine biosynthesis. To inactivate the 3-phosphoglycerate mutase, the functional expressed gene was identified by sequence anal. and growth expts. A *pgm* deletion mutant was only able to grow in presence of both a glycolytic and a gluconeogenetic substrate. Thereby, the non-PTS sugar maltose was metabolized preferentially to glucose that is taken up via a PTS system. It has been shown that the mutant accumulates the unphosphorylated L-serine precursor glycerate. To investigate the L-serine degradation the L-serine dehydratase encoding gene was identified in the *C. glutamicum* genome by sequence comparison. The subsequent deletion of the *sdaA* gene resulted in a 1.8-fold decreased L-serine degradation rate in comparison to the wild type but the overexpression of *sdaA* led to a 2-fold increased degradation rate. Interestingly, the overexpression of *sdaA* enabled *C. glutamicum* to grow on L-serine. The deletion of the *sdaA* gene in a *C. glutamicum* strain overexpressing the L-serine biosynthesis genes revealed a 960-fold gain of the L-serine accumulation. After an addnl. deletion of either the 3-phosphoglycerate mutase or pyruvate kinase encoding gene, a further increase of the L-serine formation was found. Further it was shown that the deletion of *sdaA* and the simultaneous reduction of the serine hydroxymethyltransferase activity, another L-serine converting enzyme, in a strain overexpressing the L-serine biosynthesis genes, led to a tremendous increase of L-serine accumulation up to 100 mM.  
REFERENCE COUNT: 178 THERE ARE 178 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L3 ANSWER 4 OF 7 CAPLUS COPYRIGHT 2007 ACS on STN  
ACCESSION NUMBER: 1989:473562 CAPLUS  
DOCUMENT NUMBER: 111:73562  
TITLE: Effects of L-serine dehydratase activity on L-serine production by  
Corynebacterium glycophilum and an examination of the properties of the enzyme  
AUTHOR(S): Kubota, Koji; Yokozeki, Kenzo; Ozaki, Hachiro  
CORPORATE SOURCE: Cent. Res. Lab., Ajinomoto Co., Inc., Kawasaki, 210, Japan  
SOURCE: Journal of Fermentation and Bioengineering (1989),

67(6), 391-4  
CODEN: JFBIEX; ISSN: 0922-338X

DOCUMENT TYPE: Journal  
LANGUAGE: English

AB The results with *C. glycinophilum* AJ-3170 and various mutants from AJ-3170 indicated that L-serine production was almost inversely proportional to L-serine degrading activity. The crude extract of the parental strain, AJ-3170, showed L-serine and L-threonine degrading activities. The 2 activities were completely separated from each other by gel filtration, indicating that each activity comes from a different enzyme. The L-serine-degrading enzyme, L-serine dehydratase (SD), was purified 30-fold from AJ-3170. The mol. weight of SD was 130,000. The enzyme was specific for L-serine, activated slightly by FeCl<sub>2</sub>, and inhibited by MnCl<sub>2</sub>. The double reciprocal plots of SD rate against substrate concentration gave an upwards-curved line. The value of [S]0.5 was

35

mM.

L3 ANSWER 5 OF 7 CAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1985:147428 CAPLUS

DOCUMENT NUMBER: 102:147428

TITLE: Improved production of L-serine by mutants of *Corynebacterium glycinophilum* with less serine dehydratase activity

AUTHOR(S): Kubota, Koji

CORPORATE SOURCE: Cent. Res. Lab., Ajinomoto Co., Inc., Kawasaki, 210, Japan

SOURCE: Agricultural and Biological Chemistry (1985), 49(1), 7-12

CODEN: ABCHA6; ISSN: 0002-1369

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Fermentative production of L-serine [56-45-1] using glycine [56-40-6] as a precursor and *C. glycinophilum* as a microbial producer was improved by decreasing the enzymic degradation of L-serine. The cellular activity of L-serine dehydratase [EC 4.2.1.13] (SD) [9014-27-1], which was responsible for serine degradation, was decreased in mutants that could not assimilate L-serine as a N source or that required amino acids for growth. Typical examples of the mutants were an L-leucine and L-isoleucine auxotroph (AJ-3413) whose SD activity was 32% of that of the parent. They accumulated 13.8 and 13.9 mg L-serine/mL, resp., from 30 mg glycine/mL, with a production yield of 46%, compared to the parenteral productivity of 15.3%.

L3 ANSWER 6 OF 7 LIFESCI COPYRIGHT 2007 CSA on STN

ACCESSION NUMBER: 85:10269 LIFESCI

TITLE: Improved production of L-serine by mutants of *Corynebacterium glycinophilum* with less serine dehydratase activity.

AUTHOR: Kubota, K.

CORPORATE SOURCE: Cent. Res. Lab., Ajinomoto Co., Inc., 1-1, Suzuki-cho, Kawasaki-ku, Kawasaki, Kanagawa 210, Japan

SOURCE: AGRIC. BIOL. CHEM., (1985) vol. 49, no. 1, pp. 7-12.

DOCUMENT TYPE: Journal

FILE SEGMENT: J; A; W

LANGUAGE: English

SUMMARY LANGUAGE: English

AB Fermentative production of L-serine using glycine as a precursor and *Corynebacterium glycinophilum* as a microbial producer was improved by decreasing the enzymatic degradation of L-serine. The cellular activity of L-serine dehydratase (SD) which was responsible for the L-serine degradation, was decreased in mutants that could not assimilate L-serine as a nitrogen source or that required amino acids for their growth. Typical examples of the mutants

were an L-leucine and L-isoleucine auxotroph (AJ-3414) which completely lacked SD and an L-leucine and L-methionine auxotroph (AJ-3413) whose SD activity was 32% of that of the parent. They accumulated 13.8 and 13.9 mg/ml of L-serine, respectively, from 30 mg/ml of glycine with a production yield of 46% as compared to the parental productivity of 15.3%.

L3 ANSWER 7 OF 7 LIFESCI COPYRIGHT 2007 CSA on STN  
ACCESSION NUMBER: 85:9306 LIFESCI  
TITLE: Microorganism strains for the fermentative preparation of L-serine.  
AUTHOR: Lovinger, G.G.; Whitehead, S.A.  
CORPORATE SOURCE: W.R. Grace and Co., New York, NY (USA)  
PATENT INFO.: US 4528273 1985  
SOURCE: (1985) . US Cl. 435/116; Int. Cl. C12P 13/06, C12R 1/15..  
DOCUMENT TYPE: Patent  
FILE SEGMENT: A; W  
LANGUAGE: English

AB A patent is described for improving a strain of *Corynebacterium* *glycinophilum* which is capable of converting glycine to L-serine by introducing mutations into the organism for serine dehydratase negativity and resistance to at least of the amino acid analogs (serine hydroxamate, glycine hydroxamate or methionine hydroxamate. A process is described for the fermentation of glycine to L-serine by the improved bacteria.

=> s serine (w) dehydratase and mutant and corynebacterium and gene  
L1 1 SERINE (W) DEHYDRATASE AND MUTANT AND CORYNEBACTERIUM AND GENE

=> s l1 and nucleic  
L2 0 L1 AND NUCLEIC

=> s serine (w) dehydratase and mutant and corynebacterium  
L3 7 SERINE (W) DEHYDRATASE AND MUTANT AND CORYNEBACTERIUM

=> d ibib abs l1

L1 ANSWER 1 OF 1 CAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2004:556884 CAPLUS

DOCUMENT NUMBER: 141:156155

TITLE: Study of glycolysis and L-serine metabolism in  
Corynebacterium glutamicum

AUTHOR(S): Netzer, Roman

CORPORATE SOURCE: Inst. fuer Biotechnologie, Juelich, 4130, Germany

SOURCE: Berichte des Forschungszentrums Juelich (2004),  
Juel-4130, i-xii, 1-141

CODEN: FJBEE5; ISSN: 0944-2952

DOCUMENT TYPE: Report

LANGUAGE: German

AB The amino acid L-serine is a central metabolite in the metabolism and of increasing importance for the industrial use. The aim of this work was to investigate if L-serine can be produced biotechnol. by Corynebacterium glutamicum and to study the influence of L-serine degradation and the provision of glycolytic precursors. To improve the availability of glycolytic precursors for the L-serine biosynthesis, a pyruvate kinase and 3-phosphoglycerate mutase deletion mutant was constructed. It could be shown that pyruvate kinase is essential for growth both on the non PTS (phosphotransferase system) sugar ribose and on the gluconeogenetic substrates acetate and citrate. Global gene expression analyses and enzyme assays with a suppressor mutant showed, that the growth of the pyruvate kinase mutant on acetate and citrate could be restored by overexpression of the *mez* gene encoding the malic enzyme. Further it was shown, that the pyruvate kinase mutant accumulates glycolytic precursors for L-serine biosynthesis. To inactivate the 3-phosphoglycerate mutase, the functional expressed gene was identified by sequence anal. and growth expts. A *pgm* deletion mutant was only able to grow in presence of both a glycolytic and a gluconeogenetic substrate. Thereby, the non-PTS sugar maltose was metabolized preferentially to glucose that is taken up via a PTS system. It has been shown that the mutant accumulates the unphosphorylated L-serine precursor glycerate. To investigate the L-serine degradation the L-serine dehydratase encoding gene was identified in the *C. glutamicum* genome by sequence comparison. The subsequent deletion of the *sdaA* gene resulted in a 1.8-fold decreased L-serine degradation rate in comparison to the wild type but the overexpression of *sdaA* led to a 2-fold increased degradation rate. Interestingly, the overexpression of *sdaA* enabled *C. glutamicum* to grow on L-serine. The deletion of the *sdaA* gene in a *C. glutamicum* strain overexpressing the L-serine biosynthesis genes revealed a 960-fold gain of the L-serine accumulation. After an addnl. deletion of either the 3-phosphoglycerate mutase or pyruvate kinase encoding gene, a further increase of the L-serine formation was found. Further it was shown that the deletion of *sdaA* and the simultaneous reduction of the serine hydroxymethyltransferase activity, another L-serine converting enzyme, in a strain overexpressing the L-serine biosynthesis genes, led to a tremendous increase of L-serine accumulation up to 100 mM.

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